

REMARKS

Claims 1-37 and 39-50 are currently pending, claims 1, 15, 22, 29, 35-37, 41, and 47-49 having been amended. Applicants respectfully request reexamination and reconsideration of the pending claims in view of the amendments and remarks contained herein.

Claim Rejections – 35 U.S.C. § 103

Claims 1-5, 12-15, 21, 22, 29, 35-37, 39-41, and 47-50 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Thevenaz et al. (IEEE Transactions on Image Processing Vol. 7, No. 1, Jan. 1998) in view of Hibbard et al. (U.S. 6,266,453).

Applicants have amended independent claims 1, 15, 22, 29, and 41 to more clearly define the context in which the claimed invention is intended for use. Specifically, the current application claims various methods, a system, and a computer readable medium storing program instructions for adaptive registration of a set of medical images corresponding to first and second acquisitions of a particular patient by a single imaging modality, wherein a first acquisition image and a second acquisition image differ in one of background signal intensity and signal intensity of analogous structures.

Neither Thevenaz et al. nor Hibbard et al. teach, disclose, or suggest a method, system, or computer readable medium storing program instructions according to the context discussed above including, among other things, *prior to any resampling, estimating an amount of patient motion that occurred between first and second acquisitions of the image data by the medical imaging modality* as claimed by amended claims 1, 15, 22, 29, and 41. Thevenaz et al. disclose a method of iterative image registration, which is capable of compensating for motion, but does not perform estimation of motion prior to image resampling. (Thevenaz et al.; pages 27-30). Hibbard et al. disclose a method of aligning image volumes obtained by various imaging modalities to form a composite or fused image volume. (Hibbard et al.; col. 1, line 5- col. 2, line 20).

Therefore, Applicants respectfully submit that amended claims 1, 15, 22, 29, and 41 are novel and non-obvious in view of Thevenaz et al. and Hibbard et al.

Claims 2-5, 12-14, 21, 35-37, 39, 40, and 47-50 each ultimately depend from one of amended claims 1, 15, 29, and 41 and are therefore allowable based upon independent claims 1,

15, 29, and 41 and for other features and aspects of claims 2-5, 12-14, 21, 35-37, 39, 40, and 47-50 not discussed herein. Consequently, Applicants request withdrawal of the 35 U.S.C. § 103(a) rejection of claims 1-5, 12-15, 21, 22, 29, 35-37, 39-41, and 47-50.

Claims 6-11, 16-20, 23-28, 30-34, and 42-46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Thevenaz et al. in view of Hibbard et al., and in further view of Hill et al. (Physics in Medicine and Biology, 46 (2001) R1-R45, June 12, 2000).

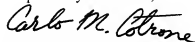
Hill et al. fail to cure the deficiencies of Thevenaz et al. and Hibbard et al. discussed above with respect to amended independent claims 1, 15, 22, 29, and 41. Further, Hill et al. discuss only the use of a gold standard, which has a target registration error of about .5mm, to test various other algorithms to determine their accuracy. The gold standard is obtained by using invasive markers in cadavers and surgical patients to obtain marked image data, which is not a practical method for use in a general patient population. (Hill et al.; R38, 11.2.).

Claims 6-11, 16-20, 23-28, 30-34, and 42-46 each ultimately depend from one of amended claims 1, 15, 22, 29, and 41 and are therefore allowable based upon independent claims 1, 15, 22, 29, and 41 and for other features and aspects of claims 6-11, 16-20, 23-28, 30-34, and 42-46 not discussed herein. Consequently, Applicants request withdrawal of the 35 U.S.C. § 103(a) rejection of claims 6-11, 16-20, 23-28, 30-34, and 42-46.

Conclusion

In light of the above, Applicants believe that the application is in condition for allowance and respectfully request that a timely Notice of Allowance be issued in this case. Applicants also request that the Examiner telephone the attorneys of record in the event a telephone discussion would be helpful in advancing the prosecution of the present application.

Respectfully submitted,



Carlo M. Cotrone
Reg. No. 48,715

File No. 026436-9045-00
Michael Best & Friedrich LLP
100 East Wisconsin Avenue, Suite 3300
Milwaukee, Wisconsin 53202-4108
(414) 271-6560